OPERATING INSTRUCTIONS

TYPE 1201-B

UNIT REGULATED POWER SUPPLY

GENERAL RADIO COMPANY

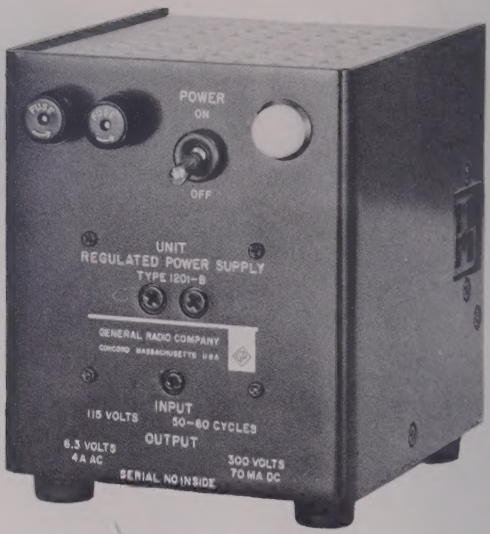

Figure 1. Panel View, Type 1201-B Unit Regulated Power Supply.

SPECIFICATIONS

Output: Dc, 300 volts ±1%, regulated to 0.25%, 70 ma, max; ac, 6.3 volts, unregulated, 4 amp.
120-Cycle Ripple: Less than one millivolt.
Tube Complement: One each 12AX7, 6AV5GA, 5651, 12AT7, 6AN8.
Input: 105 to 125 volts, 50 to 60 cps, 90 watts. Three-wire power cord is permanently attached. Can also be operated from a 400-cycle supply for applications where a 400-cycle 6.3-volt supply can be tolerated.
Accessories Supplied: Output plug for connection to equipment other than Unit Instruments, spare fuses.
Mounting: Aluminum panel and cabinet.
Dimensions: Width 5, height 5¾, depth 6¼ inches (130 by 150 by 160 mm).
Net Weight: 6 pounds (2.8 kg).

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December, 1961

TYPE 1201-B

UNIT REGULATED POWER SUPPLY

1 INTRODUCTION.

1.1 PURPOSE. The Type 1201-B Unit Regulated Power Supply (Figure 1) is designed to provide a source of regulated power for other Unit Instruments. It can also supply instruments other than those of the Unit Line, by means of a mating connector provided.

1.2 DESCRIPTION. The dimensions and output voltage ratings of the Type 1201-B Unit Regulated Power Supply are identical to those of the Type 1203 Unit Power Supply. The Type 1201-B, which features increased current ratings, greatly reduced ripple voltage, and constant output voltage, is recommended in critical applications demanding maximum performance.

2 PRINCIPLES OF OPERATION. (See Figure 2.)

2.1 GENERAL. A full-wave voltage doubler with selenium rectifiers provides the input voltage for the series regulator. The output voltage, through a voltage divider, is compared to a reference tube (Type 5651) by means of a differential cascode amplifier. The amplified error voltage is applied to a series regulator tube, through a cathode follower, to provide constant output voltage.

2.2 FEEDBACK. In addition to the main feedback loop described above, two additional signal paths inside this feedback loop are provided for improved performance. A network comprising R533 and C531 reduces the effects of input fluctuations, and R540 is used to make the open loop gain infinite. This provides a very low output impedance and reduces the effect of load changes on output voltage.

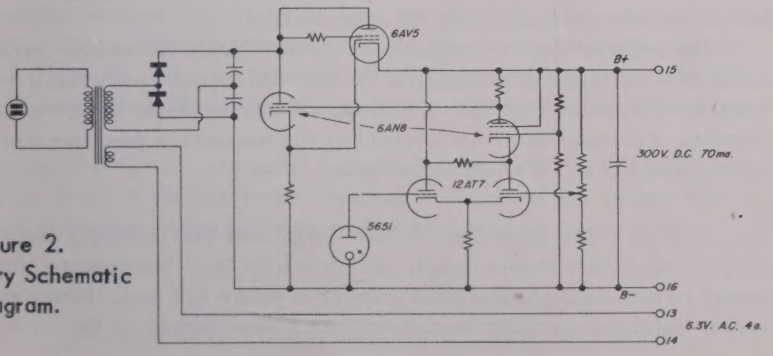


Figure 2. Elementary Schematic Diagram.

3 INSTALLATION.

3.1 CONNECTIONS. Connect the Unit Regulated Power Supply to an a-c line (105-125 v, 50-60 cps).

NOTE

The Type 1201-B will operate satisfactorily from a 400-cycle line. For load currents above 50 ma, the minimum line voltage should be 107 volts.

If the Power Supply is to be used with a Unit Instrument, plug the Unit Instrument into the four-point connector on the right side of the Power Supply.

If the Power Supply is to be used with equipment other than Unit Instruments, use the mating connector provided. Terminal numbers are marked on the plug. Connect to terminals No. 13 and 14 for 6.3 volts ac, to terminals No. 15 and 16 for 300 volts dc. (The positive terminal is No. 15.)

Both the 6.3-volt a-c and 300-volt d-c supplies are isolated from ground and from each other, to give greater latitude in external connections.

4 CHECKS AND ADJUSTMENTS.

4.1 OUTPUT VOLTAGE ADJUSTMENT. A single adjustment, R551 (Figure 3), is provided to set output voltage to 300 volts ±1%. Readjustment of the potentiometer is usually unnecessary, except after replacement of V534 (Type 5651). Adjust so that an accurate voltmeter indicates 300 volts at the output terminals.

5 SERVICE AND MAINTENANCE.

5.1 GENERAL. The two-year warranty given with every General Radio instrument attests the quality of materials and workmanship in our products. When difficulties do occur, our service engineers will assist in any way possible.

In case of difficulties that cannot be eliminated by the use of these service instructions, please write or phone our Service Department, giving full information of the trouble and of steps taken to remedy it. Be sure to mention the serial and type numbers of the instrument.

Before returning an instrument to General Radio for service, please write to our Service Department or nearest district office (see back cover), requesting a Returned Material Tag. Use of this tag will ensure proper handling and identification. For instruments not covered by the warranty, a purchase order should be forwarded to avoid unnecessary delay.

5.2 FUSES. The Type 1201-B Unit Regulated Power Supply uses 0.8-amp fuses. When the Power Supply is used with Unit Instruments, full output power is not required, and input current is below 0.8 amp. However, if both output voltages are fully loaded and the Power Supply is run on a 125-volt

line, input current is just over 0.8 amp, and fuses may blow after several hours. Therefore, substitute 1-amp fuses for continuous operation at high line voltage and full load.

5.3 COVER REMOVAL. To remove the cover, loosen the black thumbscrew on the left side of the cabinet. Slide the cover off, away from the panel.

5.4 REMOVAL OF ETCHED BOARD. While it is possible to replace all tubes and measure all voltages without removal of the etched board, access to components requires swinging the etched board out of the instrument. Remove V531 (6AV5GA) and the two screws at the rear of the etched board (see Figure 3). The board will now swing out on the hinges provided. If V531 (6AV5GA) is replaced, the instrument may be operated in this position.

5.5 TROUBLE-SHOOTING PROCEDURE.

5.5.1 EXCESSIVE RIPPLE.

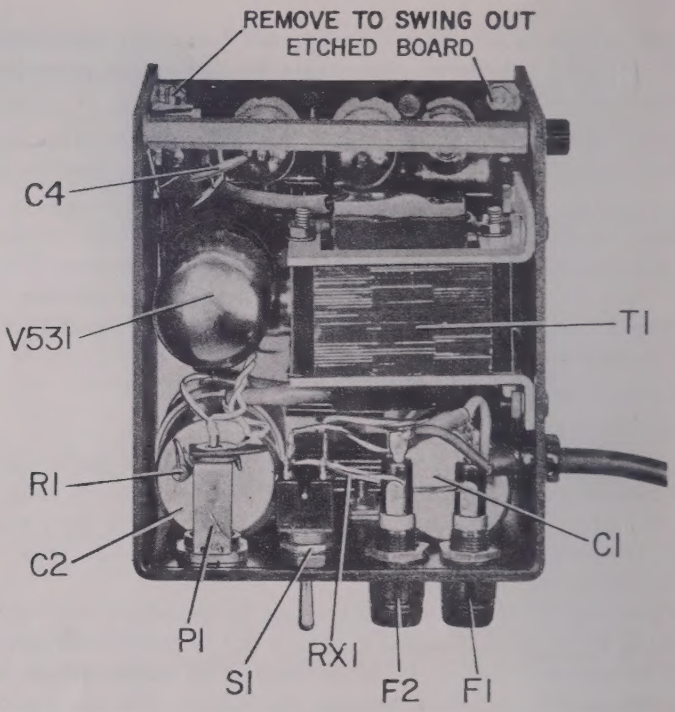
5.5.1.1 120-Cycle Ripple. Measure ripple at full load. If output ripple is excessive only at low line voltages, replace V531 (6AV5GA). If voltage across C1 and C2 is less than 400 volts at full load and 115-volt line, replace RX1 and RX2. If ripple across C1 and C2 is greater than 6 volts peak to peak (2 volts rms), replace C1 and C2.

5.5.1.2 60-Cycle Ripple. If 60-cycle ripple is excessive only at full load, one rectifier (RX1 or RX2) or one capacitor (C1 or C2) is probably faulty. If ripple is independent of load, it may be caused by heater-cathode leakage in V532 (6AN8) or V533 (12AT7). Measure d-c voltage from pin 4 or 5 of V533 (12AT7) with a vacuum-tube voltmeter. If this voltage is above 130 volts when the output voltage is 300 volts, V532 (6AN8) probably has excessive heater-cathode leakage. If this voltage is less than 110 volts when the output voltage is 300 volts, V533 (12AT7) probably has heater-cathode leakage. If this voltage is incorrect and tubes are good, check R536 and R549. Check C532.

5.5.2 INCORRECT OUTPUT VOLTAGE. If the output voltage is regulated and within a few volts of 300, reset R551 (refer to paragraph 4.1). If this adjustment drifts, replace V534 (5651).

If the output voltage drops only at low line and full load, replace V531 (6AV5GA) and check the voltage across C1 and C2. Voltage from the positive terminal of C2 to the negative terminal of C1 should be 405 volts with full load and 115-volt line. If this voltage is less than 400 volts, check RX1, RX2, C1, and C2.

If the output voltage is completely unregulated, replace V533 (12AT7) and V532 (6AN8). If tubes are not faulty, measure voltages at key points with a vacuum-tube voltmeter, comparing them with those given in Figure 4.



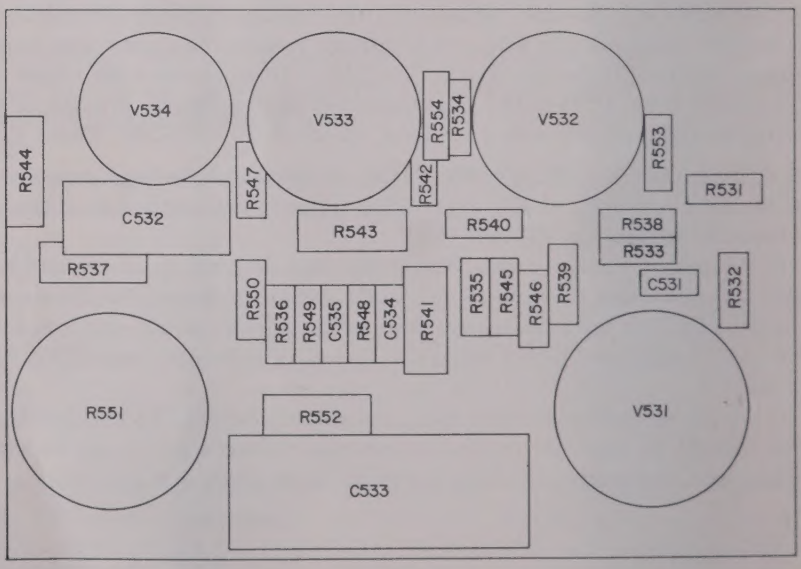


Figure 3. Interior View and Etched-Board Layout.

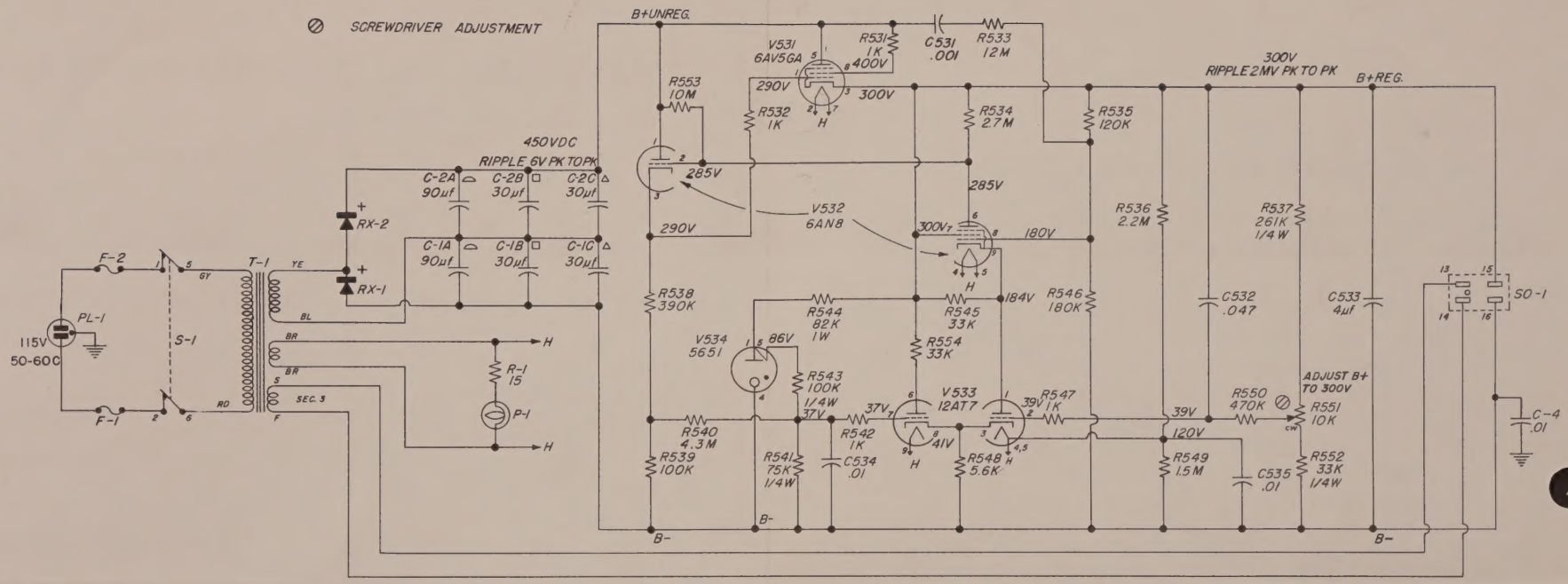


Figure 4. Wiring Diagram for Type 1201-B Unit Regulated Power Supply.

PARTS LIST

				PART NO. (NOTE A)
RESISTORS (NOTE B)	R1	15	±10% ½w	REC-20BF
	R531	1 k	± 5% ½w	REC-20BF
	R532	1 k	± 5% ½w	REC-20BF
	R533	12 M	± 5% ½w	REC-20BF
	R534	2.7 M	± 5% ½w	REC-20BF
	R535	120 k	± 5% ½w	REC-20BF
	R536	2.2 M	± 5% ½w	REC-20BF
	R537	261 k	± 1% ¼w	REF-65
	R538	390 k	± 5% ½w	REC-20BF
	R539	100 k	± 5% ½w	REC-20BF
	R540	4.3 M	± 5% ½w	REC-20BF
	R541	75 k	± 1% ¼w	REF-65
	R542	1 k	± 5% ½w	REC-20BF
	R543	100 k	± 1% ¼w	REF-65
	R544	82 k	± 5% 1 w	REC-30BF
	R545	.33 k	± 5% ½w	REC-20BF

				PART NO. (NOTE A)
	R546	180 k	± 5% ½w	REC-20BF
	R547	1 k	± 5% ½w	REC-20BF
	R548	5.6 k	± 5% ½w	REC-20BF
	R549	1.5 M	± 5% ½w	REC-20BF
	R550	470 k	± 5% ½w	REC-20BF
	R551	10 k	±10%	POSW-3
	R552	33 k	± 1% ¼w	REF-65
	R553	10 M	± 5% ½w	REC-20BF
	R554	33 k	± 5% ½w	REC-20BF
CAPACITORS (NOTE C)	C1A	90	300 dcwv	COE-52
	C1B	30		
	C1C	30		
	C2A	90	300 dcwv	COE-52
	C2B	30		
	C2C	30		
	C4	0.01	±20% 500 dcwv	COC-62

			PART NO. (NOTE A)
C531	0.001	±20% 500 dcwv	COC-60
C532	0.047	±10% 400 dcwv	COW-25
C533	4	450 dcwv	COE-32
C534	0.01	±20% 500 dcwv	COC-62
C535	0.01	±20% 500 dcwv	COC-62
F1	FUSE, 0.8 amp Slo-Blo 3AG		FUF-1
F2	FUSE, 0.8 amp Slo-Blo 3AG		FUF-1
P1	LAMP, 6.3 v, Mazda #44		2LAP-939
RX1	RECTIFIER		2RE-11
RX2	RECTIFIER		2RE-11
S1	SWITCH, dpst		SWT-333, NP
T1	TRANSFORMER		485-495
V531	TUBE		6AV5GA
V532	TUBE		6AN8
V533	TUBE		12AT7
V534	TUBE		5651

NOTES:

(A) Type designations for resistors and capacitors are as follows:
- COC - Capacitor, ceramic
- COE - Capacitor, electrolytic
- COW - Capacitor, wax
- POSW - Potentiometer, wire-wound
- REC - Resistor, composition
- REF - Resistor, film

(B) All resistances are in ohms, except as otherwise indicated by k (kilohms) or M (megohms).

(C) All capacitances are in microfarads.

When ordering replacement components, be sure to include complete description as well as Part Number. (Example: R85, 51 k ±10%, ½w, REC-20BF.)

OTHER GENERAL RADIO UNIT INSTRUMENTS

Type 1203 Unit Power Supply
Type 1205 Adjustable Regulated Power Supply
Type 1206 Unit Amplifier
Type 1208 Unit Oscillator (65 - 500 Mc)
Type 1209-B Unit Oscillator (250 - 920 Mc)
Type 1209-BL Unit Oscillator (180 - 600 Mc)
Type 1210 Unit R-C Oscillator (20 c - 0.5 Mc)
Type 1211 Unit Oscillator (0.5 - 50 Mc)
Type 1212 Unit Null Detector
Type 1213 Unit Time/Frequency Calibrator
Type 1214 Unit Oscillator (400 and 1000 cycles)
Type 1215 Unit Oscillator (50 - 250 Mc)
Type 1216 Unit I-F Amplifier
Type 1217 Unit Pulser
Type 1218 Unit Oscillator (900 - 2000 Mc)
Type 1219 Unit Pulse Amplifier
Type 1220 Unit Klystron Oscillator

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